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GLANDULARIA MALPAISANA (VERBENACEAE), A NEW SPECIES FROM SONORA, MEXICO

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ABSTRACT

Glandularia malpaisana Van Devender & Nesom, sp. nov., is described from basalt flows west of Moctezuma in east-central Sonora, where it apparently is endemic. It is distinct in its annual duration, small stature, stipitate-glandular stems and leaves, ovate leaf blades with toothed to shallowly lobed margins, short inflorescences, calyces 5–6 mm with shallowly deltate to subtruncate lobes, corolla tubes 3–5 mm long and limbs 4-5 mm wide, and nutlets 2.5–2.8 mm, with a flanged, stipe-like base and with commissure reaching the apex. Color photos and comparisons to *G. gooddingii*, *G. pumila*, and *G. delticola* are provided.

KEY WORDS: *Glandularia malpaisana*, *Glandularia gooddingii*, *Glandularia pumila*, *Glandularia delticola*, Verbenaceae, Sonora, Mexico

The taxonomy of *Glandularia* in North America has been considered in detail in recent studies (Umber 1979; Turner 1998, 1999; Nesom 2010a, 2010b) following the broader study of *Verbena* sensu lato by Perry (1933). The new species described here was discovered in the *malpais,* an extensive basalt lava flow near Moctezuma, Mexico (Fig. 4), in February 2012.

Glandularia malpaisana T.R. Van Devender & Nesom, sp. nov. Figures 1–3. **TYPE: MEXICO. Sonora**. Mpio. de Divisaderos: 10 km (by air) N of Tepache, 23.9 km (by air) SSE of Moctezuma, 29° 37' 29" N, 109° 31' 53" W, sparsely open foothills thornscrub on basalt cobble plain, 728 m elev., locally common annual, flowers pink, 15 Feb 2012, *T.R. Van Devender 2012-195* with A.L. Reina-G. (holotype: ARIZ; isotypes: MEXU, TEX, others).

Distinct in its small stature, stipitate-glandular stems and leaves, ovate leaves with toothed to shallowly lobed margins, short inflorescences, calyces 5–6 mm with shallowly deltate to subtruncate lobes, corolla tubes 3–5 mm long and limbs 4-5 mm wide, and nutlets 2.5–2.8 mm with commissure reaching the apex and with a flanged, stipe-like base. Similar to *Glandularia gooddingii* (Briq.) Solbrig in its lobed to coarsely toothed leaves (vs.pinnatifid), stipitate-glandular stems, and distribution in western North America but different in its annual, slender-taprooted duration and habit with stems erect from the base, smaller leaves, and much smaller inflorescences, flowers, and fruits.

Plants annual, slender-taprooted. **Stems** erect to ascending from the base, 9–25 cm, simple or branching from the base, pilose-hirsute with stiff, sharp-pointed, eglandular hairs 0.2–1.2 mm, stipitate-glandular along the whole length with gland-tipped hairs 0.1–0.2 mm. **Leaves**: blades deltate to ovate or broadly ovate in outline, membranaceous, 1.5–2 times longer than wide, midstem

Figure 1. *Glandularia malpaisana*, habit and habitat. Photo by T.R. Van Devender, 15 Feb 2012.

Figure 2. *Glandularia malpaisana*, stem apices. Photo by T.R. Van Devender, 15 Feb 2012.

Figure 3. *Glandularia malpaisana*, inflorescence. Photo by T.R. Van Devender, 15 Feb 2012.

10–18 mm, hirsute-strigose to strigose adaxially, hirsute abaxially, sparsely stipitate-glandular on both surfaces, margins toothed to shallowly lobed, deepest lobes 1/3–1/2 to midrib, ultimate segments ovate to ovate-lanceolate, apices rounded; petioles 3–10 mm. **Inflorescence** 5–20 cm in flower, mostly remaining compact, elongating to ca. 10–25 mm in fruit; flowers 9–18; floral bracts half the length of the calyces. **Calyces** 5–6 mm, pilose-hirsute and minutely stipitate-glandular, lobes very shallowly deltate to subtruncate-mucronulate. **Corollas** pink, tubes 3–5 mm, sparsely pilose, limbs 4–5 mm in diam. **Nutlets** cylindric, 2.5–2.8 mm, not broadened at the base, mature color not seen, commissure reaching the apex, 3/4–4/5 as wide as the nutlet apex, apical appendage absent, base with thin-flanged stipe-like appendage.

The new species is only known from the extensive (ca. 275 km^2) basalt flows south of the Sierra de la Madera and west of Moctezuma in east-central Sonora. The habitat is unique with regularly spaced black stones emerging from a dark, clay-rich soil derived from the eroding basalt. This soil becomes very sticky when wet and contracts when dry. The vegetation is foothills thornscrub, which occupies a broad area between Sonoran desertscrub to the west, tropical deciduous forest to the southeast, and oak woodland in the Sky Island mountain ranges and the Sierra Madre Occidental to the east. On the Moctezuma lava plain, foothills thornscrub is of short stature and the trees are small and widely spaced.

The Sierra la Madera, a Sky Island mountain range in east-central Sonora, Mexico, is an area of floristic interest for the Madrean Archipelago Biodiversity Assessment (MABA) program at Sky Island Alliance in Tucson, Arizona, and the Universidad de la Sierra (UNISIEERA) in Moctezuma, Sonora. Floristic observations and collections, including a MABA Expedition in August 2010, from the Municipio (= County) of Moctezuma are available online in the MABA database (Madrean.org), which is a node of the Southwestern Environmental Information Network (SEINet) database of herbarium collections.

Figure 4. Basalt lava flow west of Moctezuma, Sonora. Habitat of *Glandularia malpaisana.*

Other plants of interest from the lava plain include disjunct populations of *Viguiera purisimae* Brandegee, a species of Asteraceae common in Baja California and southern California, and *Croton lindheimerianus* Scheele, a Chihuahuan Desert species found from Texas west to Arizona. The holotypes of *Melampodium moctezumum* B.L. Turner and *Verbena moctezumae* Nesom & Van Devender (2010) were collected in the same habitat.

In Sonora, Mexico, *Glandularia gooddingii* (Nesom 2010b) might be postulated as a close relative of *Glandularia malpaisana*, chiefly because of their non-pinnatifid leaves, but the two are distinguished by a number of unambiguous features, including the following.

1. Annual; midstem blades 10–18 mm; inflorescence elongating to 10–25 mm in fruit; corolla tubes 3–5 mm, limb 4–5 mm in diam; nutlet commissure reaching the apex ..... **Glandularia malpaisana**
1. Perennial; midstem leaf blades 20–50 mm; inflorescence elongating to 20–50(–80, –100) mm in fruit; corolla tubes 8–9(–10) mm, limb 10–14 mm in diam; nutlet commissure not reaching the apex ..... **Glandularia gooddingii** (Briq.) Solbrig

Glandularia pumila and *G. malpaisana* are similar in their small stature, small flowers, and ovate, non-pinnatifid leaves, but the two perhaps are not very closely related within the genus. They are easily separated by the following contrasts.

1. Stems erect to ascending-erect from the base; calyx lobes shallowly deltate to subtruncate; corolla tubes 3–5 mm; nutlet commissure reaching the apex ..... **Glandularia malpaisana**
1. Stems mostly prostrate or decumbent-ascending; calyx lobes filiform; corolla tubes 5–7 mm; nutlet commissure not reaching the apex ..... **Glandularia pumila** (Rydb.) Umber

Close in morphology to *Glandularia malpaisana* is *G. delticola* of the Rio Grande Valley of southeastern Texas and southward through eastern Mexico to Chiapas. The two are similar in leaf shape and margin, very small flowers, and nutlet morphology (commissure reaching the apex). In addition to the wide geographic disjunction, however, the two differ in various features.

1. Stems erect, consistently stipitate-glandular; midstem leaf blades 30–50(–60) mm; calyx lobes shallowly deltate to subtruncate; corolla tubes 3–5 mm, limbs 4–5 mm in diam; nutlets 2.5–2.8 mm ..... **Glandularia malpaisana**
1. Stems procumbent to ascending, eglandular or very sparsely stipitate-glandular; midstem leaf blades 30–50(–60) mm; calyx lobes filiform; corolla tubes 7–10 mm, limbs 5–7 mm in diam; nutlets 2.1–2.5 mm ..... **Glandularia delticola** (Small ex Perry) Umber

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